

Compositae of Southern California.—H. M. HALL¹⁸ has brought together our present knowledge of the Compositae of Southern California, an area about the size of Pennsylvania. The 445 species and varieties are distributed as following among the tribes: Eupatorieae (9), Astereae (113), Inuleae (25), Ambrosieae (18), Heliantheae (34), Madieae (29), Helenieae (86), Anthemideae (19), Senecioneae (25), Cynareae (17), Mutisieae (2), Cichorieae (68). These numbers would be largely increased if the author were not very conservative in his conception of species. As it is, the contribution becomes a manual of readily recognized forms, which are further brought within easy reach by the numerous well-constructed keys. It is unusual to find in so extensive a contribution that only three new species have been described, two in *Aster* and one in *Lessingia*. However, there is large recognition of varieties, many new ones being proposed; and new combinations are frequent. The reduction of numerous names to synonymy may be a service or may add to the confusion, dependent upon the care with which the types were studied. In any event, this type of monograph for so interesting a region is to be commended.—J. M. C.

Nuclear division in Zygnema.—ESCOYEZ¹⁹ has published the results of cytological studies on *Zygnema*. The conclusions are as follows: (1) A chromatin network forms chromosomes by gradual concentration. (2) The nucleolus contains no chromatin substance and does not furnish any morphological elements to the chromosomes. (3) The chromosomes are not formed by the fusion of four groups of chromatin granules, as was claimed by Miss MERRIMAN. (4) The chromosomes split longitudinally in the metaphase as in typical mitosis. (5) In the telophase the chromosomes first become massed at the poles and then vacuolated. The anastomosed structure of the nucleus consists entirely of chromosomes. (6) The nucleolus is not formed by the confluence of chromosomes, but appears quite independent of the chromatin network. (7) There is formed no continuous spirem, and the chromosomes evidently keep their individuality. (8) Pyrenoids and chromatophores divide simply by constriction, and the division is independent of that of nucleus. The division of the two pyrenoids does not necessarily occur simultaneously.—S. YAMANOUCHI.

The double leaf trace.—MISS THOMAS²⁰ has brought together the facts in reference to the double leaf-trace, so characteristic of the ancient fern and older gymnosperm series, and well marked in the living cycads. This condition is claimed to exist in the "double bundle" of the cotyledons of angiosperms, and is of very frequent occurrence in modern ferns. A phenomenon of such wide occurrence suggests "the existence of a common cause of a fundamental and primitive character," and this the author finds in dichotomous branching; which means

¹⁸ HALL, H. M., *Compositae of Southern California*. Univ. Calif. Publ. Bot. 3:1-302. pls. 1-3. 1907.

¹⁹ ESCOYEZ, EUD., *Le noyau et la caryocinèse chez le Zygnema*. *La Cellule* 24:356-366. pl. 1. 1907.

²⁰ THOMAS, ETHEL N., *A theory of the double leaf-trace founded on seedling structure*. *New Phytologist* 6:77-91. figs. 4. 1907.